

Obesity, Nutrition and Lifestyle

by Professor Mark L Wahlqvist

We live in a society, abundant in food, where the food system generates jobs and capital and where little physical energy is required to ensure an individual's food supply. It is a society far removed from the checks and balances which apply to food supply and demand in hunter-gatherer societies or in subsistence economies. Instead, most factors impinging on food consumption in Australia tend to increase it^{2,6,15}. If obesity is reckoned to be a body weight 20% or more of the ideal, then probably more than 20% of Australians are obese. However, adequate information of this kind, crucial to health care planning is lacking in Australia.

The relationship between affluence and obesity is not a simple one. Stunkard, from the University of Pennsylvania, has shown that lower socioeconomic groups in Western urban society have the maximum prevalence of obesity¹⁸. Presumably the pressures on such people to spend available funds on available food and with limited recreational possibilities lead to obesity.

Does It Matter?

Life insurance tables have provided an important line of evidence that excess weight, especially above 20% of the so-called ideal body weight, confer risk of increased mortality¹⁷. The prospective study of heart disease in Framingham, U.S.A., showed a marked increase in sudden death in men more than 20% overweight¹³. An increased prevalence of hypertension, hyperlipoproteinaemia and perhaps other factors in this group may mediate the excess cardiovascular risk. Conversely, Life Insurance and Framingham data indicate that those who lose weight have less risk. There is evidence that weight reduction reduces blood pressure and plasma lipids.

There is also an excessive mortality from diabetes (375%), biliary disease (150-280%), appendicitis (195-290%), cirrhosis of the liver (250%), and accidents (130%) associated with obesity. The diseases are not necessarily caused by obesity, but in the case of maturity onset diabetes, its emergence would appear dependent on the presence of obesity in the majority of cases.

Of considerable interest are recent data which suggest that obesity and fat consumption may predispose to endometrial cancer and breast cancer¹.

The mortality data say nothing of the morbidity which arises with obesity in the form of psychological disorders, respiratory distress, osteoarthritis, and amenorrhoea. The impact of obesity on self-esteem, opportunities for physical recreation and employment prospects are also often overlooked.

Sociology of Obesity

Obesity can occur at different stages of development - infancy, childhood, adolescence and adulthood. Drs John Court and Majorie Dunlop at the Royal Children's Hospital in Melbourne have contributed importantly to the understanding of infant as opposed to childhood obesity^{4,5}. Various workers have raised the possibility that infant obesity may be determined by maternal dietary patterns and the consequent foetal metabolic milieu. The preventive aspects of infant obesity require further

investigation. Childhood obesity is a serious matter as 80% or so of such children will go on to become obese adults⁴.

Generally speaking, overweight is seen as undesirable in Australian society. Even for minority cultural sub-groups, where children and married women may be preferred if obese, such persons come into conflict with the mainstream of Australian society. It is all the more remarkable then that obesity should be so prevalent. This must indicate the tremendous influence of factors leading to positive energy balance.

A substantial proportion of advertising in Australia is directed towards food and drink. The potential impact of confectionary, sugar-based breakfast cereal, soft drink and ready-to-eat food promotion in children's television on the ultimate health of this generation of children is most disturbing to contemplate. It is to be hoped that the Australian Broadcasting Tribunal comes to grips with this issue in the foreseeable future.

Contemporary fashion in clothing encourages slimness. The *Life Be In It* Campaign encourages physical activity. More information about food is available and a campaign to label food adequately is underway. These factors will tend to offset the massive food and drink promotional effort, but may not be sufficient. Obesity is very much a societal problem and legislative action will be required to curtail, for example, food advertising.

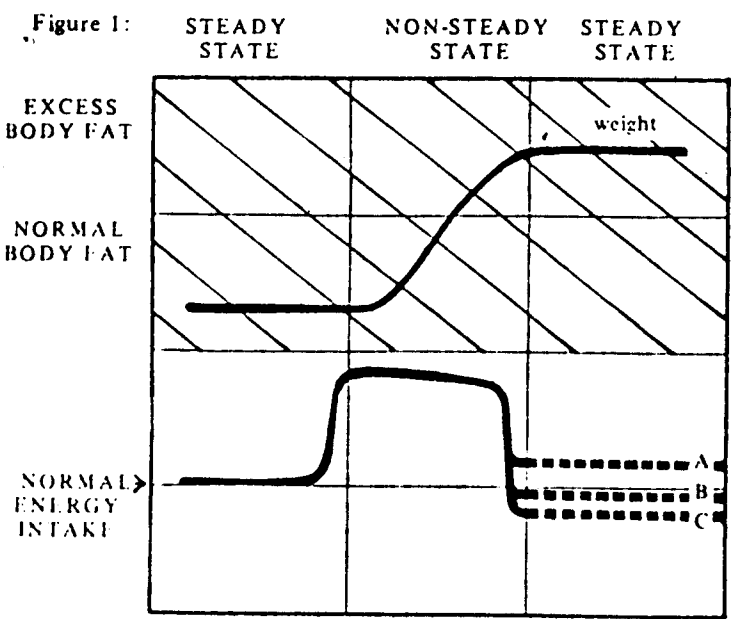
The increased dependance on food eaten outside of the home adds to the convenience and perhaps, efficiency of modern society. But it comes at a time when the real growth of such societies is limited and when family budgets must be more restrained. Indeed, for economic reasons alone, a return to home gardening and food preparation can be recognised amongst an increasing minority. There are other reasons for this trend of course. One is the desire to control one's own food supply. Another is that gardening is a physical activity and contributes to the individual's overall energy control. Yet another is the family integrative role of food production and consumption at home.

Energy Balance

It is true that energy put into a system must equal the energy output in steady state conditions. However, this is often misconstrued to mean that the only hope for the obese is an indefinite reduction in food intake.

In the first place, the obese person may be in a new steady state (Fig. 1). The way to that new steady state was by an excess of energy input over output. But at the new steady state, the obese may eat no more than the non-obese. It is not necessarily so that obese persons are dishonest about their current eating habits as is often implied.

The efficiency with which energy is utilized can also vary markedly¹⁴. Exercise was shown by Edwards in 1935⁷ to increase metabolic rate for up to 15 hours and not just for the period over which it was undertaken. Miller and colleagues in 1967¹⁶ reported the alteration by exercise of what he has termed the *thermic response* to a meal. Exercise after food can double the thermic response. Clearly then, it is not sufficient



management of obesity must include a programme of physical activity as well as a consideration of food intake.

Even if an individual is in a new steady state, with an energy intake comparable to that which might apply at a lower body weight, a period of reduced food intake will be desirable. In many cases, with time, increased physical activity may be adequate. The determinants of an individual's eating behaviour are, therefore, of some importance. The behavioural approach to obesity has attracted a lot of support^{12,20}. Faulty eating habits can contribute to obesity. Excess food consumption often occurs with boredom or anxiety. Self-monitoring of food intake is likely to be helpful and more so than self-monitoring of weight. Various other behavioural techniques are recommended: aversion therapy, covert sensitization, covert conditioning and therapist reinforcement – but their application on a community, rather than an institutional, basis requires further investigation. Clearly some of the techniques work some of the time, but it is often difficult to evaluate the placebo effect.

Anatomic approaches to control of energy intake may have a place in the morbidly obese (Fig. 2). Jejunio-ileal bypass now appears to have too high a complication rate⁹. Jaw-wiring is helpful in some. There is a growing interest in gastric reductive techniques such as stapling or suturing.

to look at the immediate energy cost of a particular form of exercise when considering the value of exercise in preventing obesity.

The way in which metabolic pathways operate can also lead to a range of efficiencies of fuel utilization¹¹. It now appears that enzymes can allow metabolic pathways to proceed in an anabolic and catabolic direction simultaneously allowing the possibility of *tutile cycles* or energy wasting systems. Determinants of *tutile cycles* may have implications for prevention of obesity. It is conceivable that dietary factors could be involved.

Food Consumption and Obesity

There is some evidence that a greater daily meal frequency may lead to less obesity⁸. Probably one of the more important considerations is whether food is eaten in relation to physical activity since this will lead to greater energy expenditure.

The drinking of water is increasingly forgotten in our society. Time was when it was readily available at the table. Now one is almost made to feel guilty if water is requested at a restaurant. It may actually lead to less food and beverage purchase and intake!

Serving size in Australia is in general excessive. Parents or hosts will do a service to children or guests by serving less. Planning to cook less and the ability to use leftovers wisely are relevant considerations here. In the absence of small servings, consumers need to develop the social technique which will allow them to leave food on the plate. Most Australian children are inculcated with the adage "waste not, want not". It might be better put "want not, waste not".

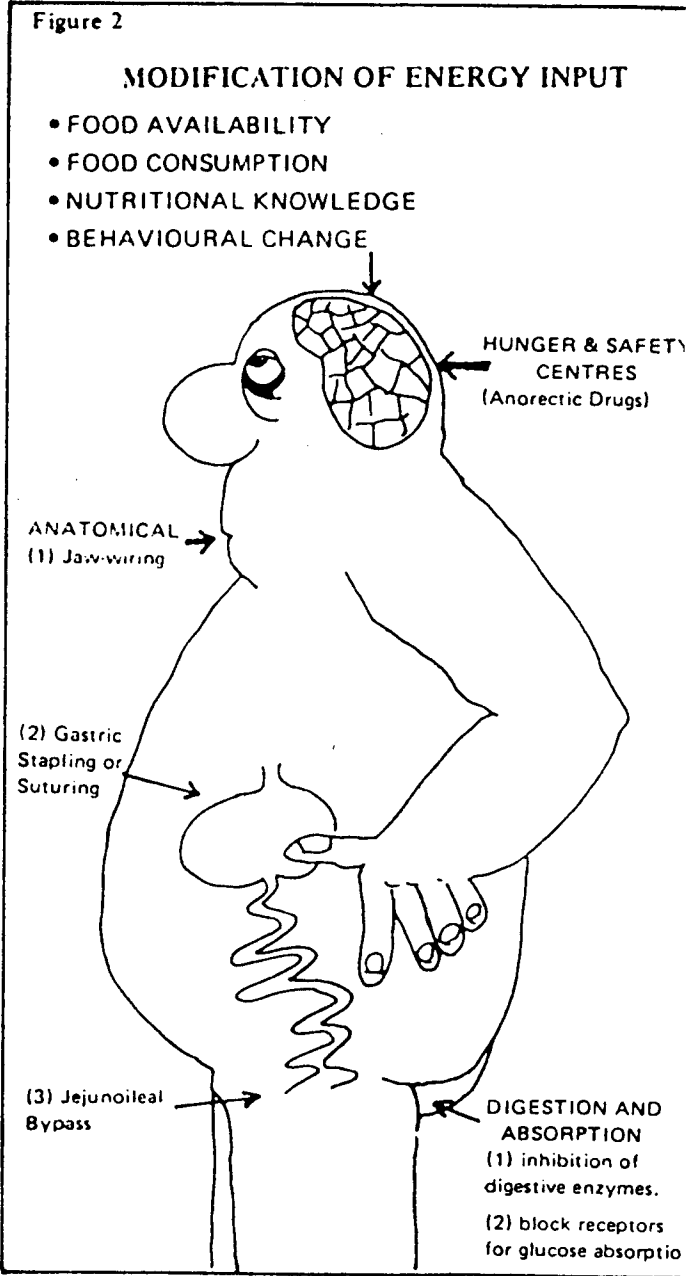
It is often forgotten how energy dense alcohol is – 30 kJ/g (7 kcal/g) – or indeed that it is a source of energy at all. Alcohol abuse must account for a good deal of obesity in Australia.

The energy density of our foods can be reduced by the use of foods rich in dietary fibre, foods without added refined carbohydrate and foods with a lower fat content.

The Australian public often does not recognise that the terms *energy* and *calorie* are interchangeable. Advertisers promote certain foods as *high-energy* implying that they give zest and vitality and others as low-calorie when weight reduction is the selling point. They also promote refined carbohydrate as a source of readily assimilable energy when there is no evidence that absorption of carbohydrate is a limiting factor in performance¹⁹.

Management of Obesity

From what has been said already, it will be clear that the



A period of fasting¹⁰ may allow a re-set of appetite, at least in the short-term. The considerable associated weight loss may provide motivation to continue with less rigorous means long-term.

Anorectic drugs may also serve to motivate by allowing definite weight loss and its associated benefits to occur. The therapist must make good use of the period of weight loss to facilitate behavioural change. There may be other pharmacological approaches to weight reduction in the near future such as inhibition of digestive enzymes and blockade of receptors for glucose absorption (Fig. 2).

Deployment of Nutrition Resources

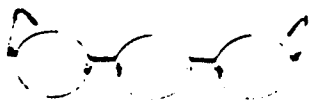
Much effort by dietitians focuses on the morbidly obese and there is little evidence that current approaches have a significant impact on this problem. We know little about the amenability of modestly obese persons to weight reduction programmes. The numbers of such persons are many and it is important that group therapy and community-based programmes be evaluated. In the final analysis, the time that nutritionists and dietitians have available may be better devoted to well-defined and carefully evaluated preventive programmes.

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